

Science Booklet

2024 - 2025

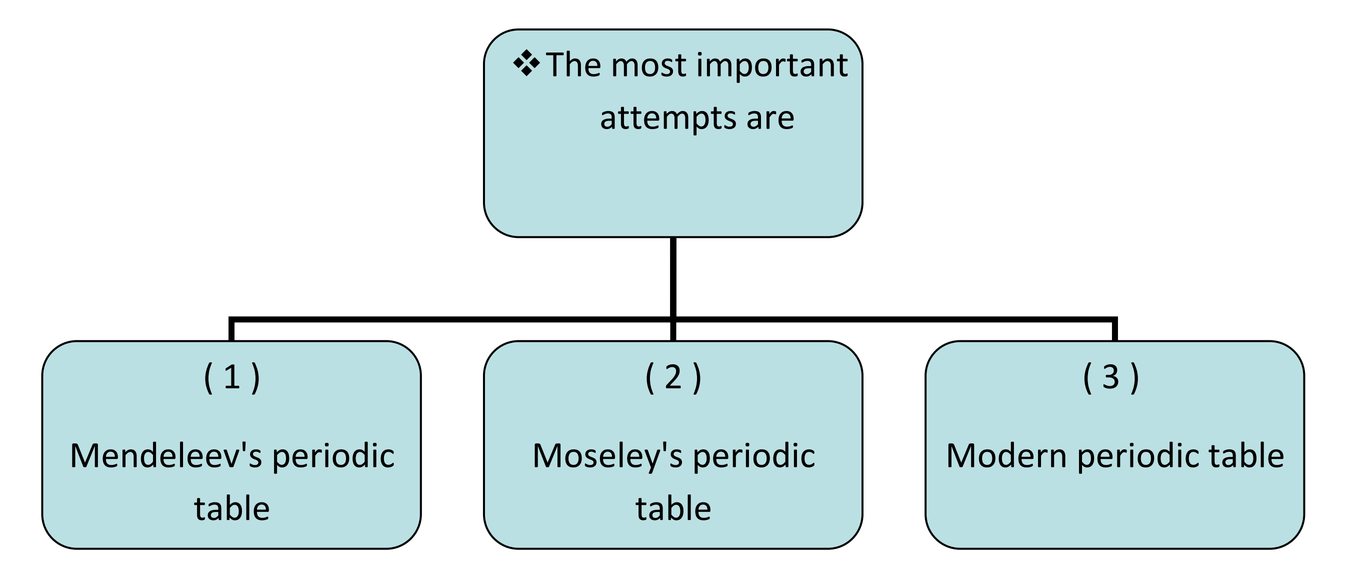
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- **Student Name:** …………………………………….
- **Class:** …………………………….

Unit (1)

Lesson 1: Attempts of elements classification.

-GR:
1- Scientists thought about classifying elements according to their properties.
In order to facilitate their study.



1. **Mendeleev's periodic table:**

The first real periodic table.
- In this time, the number of elements was **67.**
In Mendeleev's periodic table, the elements were arranged in ascending order according to their atomic weights.

ADVANTAGES OF MENDELEEV'S TABLE	DISADVANTAGES OF MENDELEEV'S TABLE
1-He left gaps in his table because he predicted the discovery of new elements. 2-He determined the values of atomic weight of some elements which were not discovered yet. 3-He corrected the atomic weights of some elements which were estimated wrongly.	1-He had to make disturbance in the ascending order of atomic weights of some elements to put them in groups that suit their properties. 2-He had to consider the isotopes of one element as different element due to the difference in their atomic weights so he had to put more than one element in one place in his table.

2. Moseley's periodic table

Rutherford discovered that the nucleus of the atom contains positively charged protons.

❖ In the same year, the British scientist Moseley:

- Named the number the positive protons as atomic number.
- After discovering x-rays properties, he found that the periodic properties of elements are related to their atomic numbers and not to their atomic weights as Mendeleev's proposed.
- Moseley arranged elements in his table in ascending order according to their atomic numbers.
- He added to the table:
    - The zero group which includes inert (noble) gases.
    - He specified a place below the table for lanthanides and actinides elements.

3. Modern periodic table

- Bohr discovered the main energy levels of the atom whose number reaches 7 in the heaviest atom.

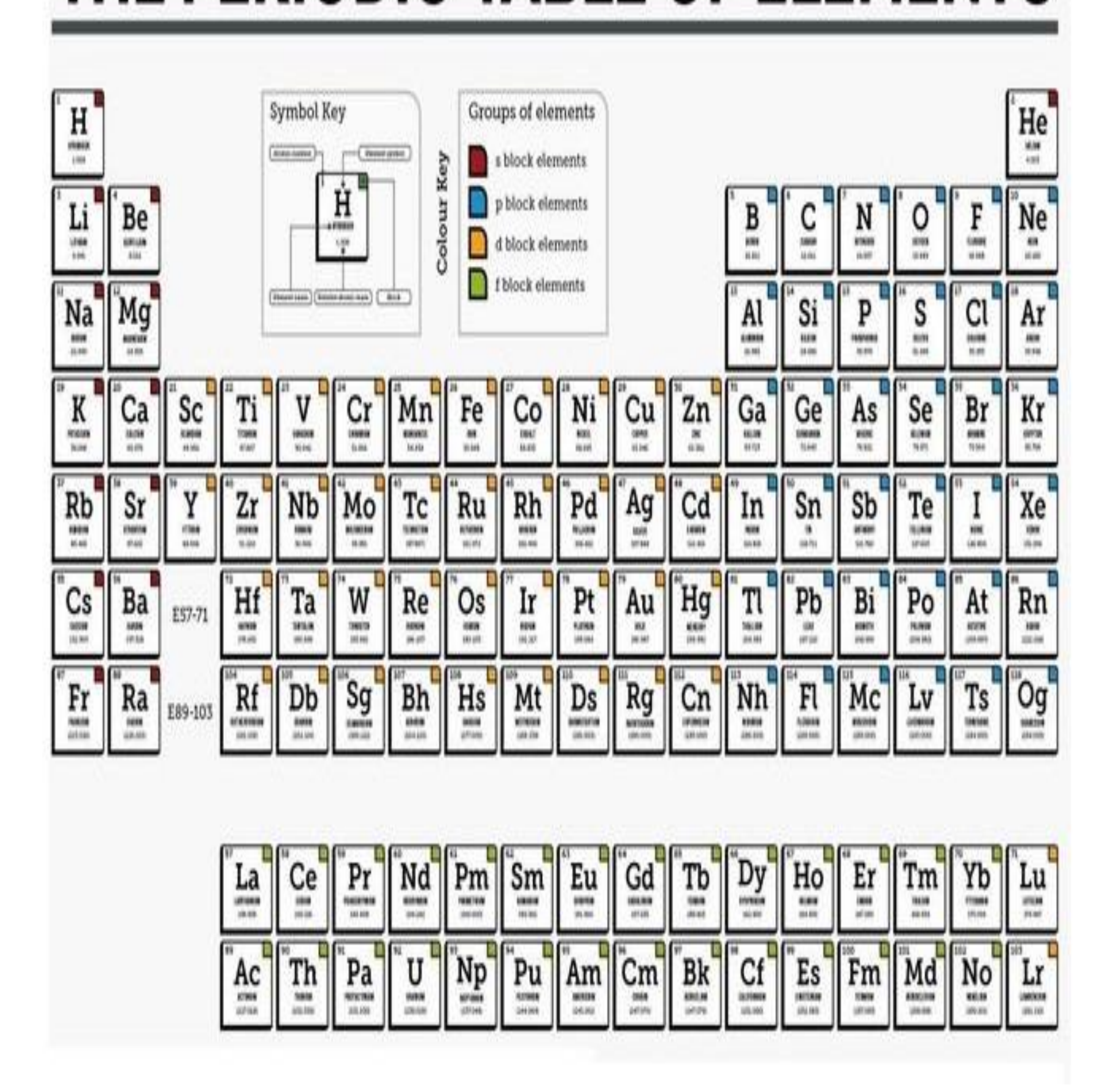
- Scientists discovered that each main energy level consists of a definite number of other levels known as energy sublevels.

The elements are classified in the modern periodic table according to:

1) Their atomic number
2) The way of filling the energy sublevels (S , P , d , f) with electrons.

Description of the modern periodic table:

- The number of known elements in the modern periodic table till now is **118** elements, **92** elements are available in Earth's crust while the others are prepared artificially.
- It consists of: **7** horizontal periods and **18** vertical groups.
- The elements of the modern periodic table are classified into 4 blocks (S , P , d , f).


THE PERIODIC TABLE OF ELEMENTS
Symbol Key
H
Colour Key
Groups of elements
s block elements
p block elements
d block elements
f block elements
H He
Li Be B C N O F Ne
Na Mg Al Si P S Cl Ar
K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn Ga Ge As Se Br Kr
Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb Te I Xe
Cs Ba E57-71 Hf Ta W Re Os Ir Pt Au Hg Tl Pb Bi Po At Rn
Fr Ra E89-103 Rf Db Sg Bh Hs Mt Ds Rg Cn Nh Fl Mc Lv Ts Og
La Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er Tm Yb Lu
Ac Th Pa U Np Pu Am Cm Bk Cf Es Fm Md No Lr

* S-BLOCK ELEMENTS	* P-BLOCK ELEMENTS	* D-BLOCK ELEMENTS	* F-BLOCK ELEMENTS
- Located on the left side. -Arranged in 2groups:(1) and (2A)	- Located on the right side. - Arranged in 6 groups: (3A),(4A),(5A), (6A),(7A) and group zero.	- Located in the middle of the periodic table. -Arranged in 8 groups:(3B), (4B), (5B) , (6B) , (7B) , (8) , (1B) and (2B). - They are known as transition elements. - They appear starting from period (4).	-Located below the periodic table. -They include lanthanides and actinides.

<u>How to locate the position of an element in the modern periodic table?</u>

3) Write the electronic configuration of the atom.
4) The number of energy levels occupied by electrons ⇨ indicates the period number.

5) The number of electron in outermost energy level ⇨ indicates the group number.

<u>Examples</u>: - Locate the position of each of the following elements in the modern periodic table.

Element	Electronic configuration	period number	Group number
Hydrogen $_1H$	K 1	1	1A
Phosphorous $_{15}P$	K L M 2 8 5	3	5A

Neon $_{10}$Ne	K L 2 8	2	Zero

*** How to determine the atomic number of an element by knowing its position in the periodic table:**

***Example:**

Calculate the atomic number of each of the following element:

Element (x) that exists in the second period and in group (7A).

Solution

1) This element has 2 energy levels and 7 electrons in the outermost energy level.
2) The atomic no. = 2 + 7 = 9 electrons.

Evaluation on lesson 1

***Complete:**

3) Mendeleev arranged the elements ascendingly according to ....
while Moseley arranged them ascendingly according to ....

4) The modern periodic table consists of .... horizontal periods, ... vertical groups.

5) What is the scientific base on which the modern periodic table classified?

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6) Locate the position of the following elements in the modern periodic table:

1H ....
10Ne ....
20Ca ....

7) Find the atomic number for the following elements.

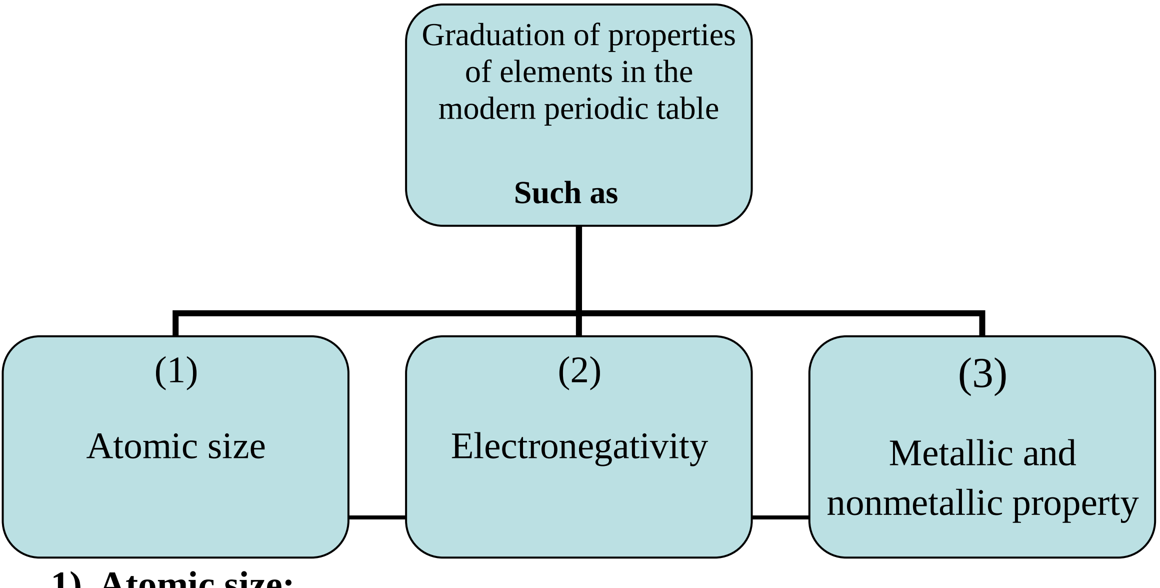
Element X lies in the first period and zero group.........
Element Y lies in the second period and 3A group.........
Element Z lies in the third period and 7A group.........

8) Classify the elements into two groups:

2He – 3li – 19K – 10Ne – 11Na

Lesson 2

Graduation of properties of elements in the modern periodic table:



1) Atomic size:

- The measuring unit of atomic radius is **picometer (pm).**
- Picometre is part from million million part of a meter.

Graduation of atomic size of elements in the periodic table

- The atomic size **decreases in periods** by increasing the Atomic number (from left to right). **GR**

Due to increasing the attraction force of the nucleus to the electrons.

- The atomic size **increases in groups** by increasing the atomic number (from up to down). **GR:**

Due to the increase in the number of energy levels

-**Note:** Cesium (Cs) has the biggest atomic size in the periodic table.

2) **Electronegativity**:
   - ability of an atom in covalent molecule to attract the electrons of the bond towards itself

- **The difference in electronegativity:**

  - Determined the kind of compound

    a) Polar compounds b) Non-polar compounds

Polar compounds :

- They are compounds in which the difference in electronegativity between the elements forming their molecules is relatively high.

  -Ex: Water(H_2O) , Ammonia (NH_3)

3) **Metallic and nonmetallic property:**

Elements in the periodic table are classified into:

1) Metals 2) Nonmetals 3)Metalloids 4) Noble gases

Metals	Nonmetals	Metalloids
They have less than 4 electrons in the outermost energy level.	They have more than 4 electrons in the outermost energy level.	They are elements which have the properties of both metals and nonmetals.
They have luster	They have no luster	.boron ($_5B$) .silicon ($_{14}Si$) .arsenic($_{33}Ar$) .terllium ($_{52}Te$)
Good conductors of heat and electricity	Bad conductors of heat and electricity except carbon	
During the chemical reaction, the atom of metal tends to lose their outermost electrons and change into positive ion.	During the chemical reaction, the atom of metal tends to gain electrons and change into negative ion.	
Positive ion	**Negative ion**	

-The atom that loses one electron or more during the chemical reaction.	- The atom that gains one electron or more during the chemical reaction.	
- It carries positive charges equal to the number of the lost electrons.	-It carries negative charges equal to the number of the gained electrons.	

<u>* Graduation of metallic and nonmetallic property in the modern periodic table:</u>

- **<u>In periods</u>**: each period starts with **<u>strong metal</u>** (in group 1A) then **the metallic property decreases** by increasing the atomic number , till reaching metalloids then the nonmetallic property appears and increases by increasing the atomic number till reaching the strongest nonmetal in group 7A (17) then the period ends with **<u>an inert gas</u>** (in group zero).

- **<u>In groups</u>**:

A) <u>GR:</u> In metallic groups: the metallic property increases by increasing the atomic number (from top to bottom).

Because the atomic size increases.

B) <u>GR</u>: In nonmetallic groups: the nonmetallic property decreases by increasing the atomic number (from top to bottom).

Due to the decrease of electronegativity

<u>Chemical properties of metals.</u>

<u>(A) Reaction with dilute acids</u>:

1- Some active metals such as magnesium (Mg) and zinc (Zn) react with dilute acids (as hydrochloric acid) giving salt of acid and hydrogen gas evolves.

$$Mg + 2HCl \rightarrow MgCl_2 + H_2$$

Magnesium   hydrochloric acid   magnesium chloride   hydrogen gas

2- Inactive metals such as copper (Cu) don't react with dilute acids and no hydrogen gas evolves.

Cu + HCl → No reaction
copper hydrochloric acid

3- Some metals such as magnesium (Mg) and iron (Fe) react with oxygen giving metal oxides which are called *“* ***Basic oxides*** *”*.

2 Mg + O_2 → 2 MgO (magnesium oxide)

4- Some basic oxides (as magnesium oxide) dissolve in water giving alkalis (metal hydroxide) which turns litmus solution into blue.

MgO + H2O → $Mg(OH)_2$ (magnesium hydroxide)
Magnesium oxide water

5-Some basic oxides such as iron oxide don’t dissolve in water.

Basic oxides: they are metallic oxides that dissolve in water giving alkalis

B) Reaction with water : The reaction of metals with water depends on the position of the metal in the chemical activity series.

Chemical activity series: it is a series in which metals are arranged in descending order

according to their chemical activity

Metals	Reaction with water
Sodium Na **Potassium K**	They react with water instantly and hydrogen gas evolves burning with pop sound.
Calcium Ca **Magnesium Mg**	They react very slowly with cold water.
Zinc Zn **Iron Fe**	They react with hot water vapour at high temperature only.
Copper Cu **Silver Ag**	They don’t react with water

Chemical properties of nonmetals

A) Reaction with dilute acids:

- All nonmetals (as carbon (C) and sulpher (S)) don't react with dilute acids (as HCl).

(B) Reaction with oxygen:

-Nonmetals (such as carbon (C))react with oxygen giving nonmetal oxides which are known as " ***acidic oxides*** "

C + O_2 → CO_2 (carbon dioxide)

- Nonmetal oxides (acidic oxides) dissolve in water giving acids which turn litmus solution into red.

CO_2 + H_2O → H_2CO_3 (carbonic acid)

Acidic oxides :they are nonmetal oxides that dissolve in water forming acids

Questions on lesson 2

Put (√) or (x) in front of the following statements and correct the wrongones:

(1) The atomic size increases by the increase of the atomic number. (   )
(2) Water and ammonia are from polar compounds. (   )
(3) Some alkalis dissolve in water forming bases. (   )
(4) The solutions produced from dissolving the non-metal oxides in water turn the violet litmus solution into red. (   )

2-Choose the correct answer between bracktes:

(1) Each period in the modern periodic table starts with .... element.
(metallic - semimetallic - nonmetallic - inert)
(2)In the same period, the element which has the highest electro negativity lies ingroup ....
(0 - 7 A - 2 A - 1 A)
(3) When sodium react with water .... gas evolves.
(O_2 - CO_2 - H_2 -N_2)

3-What is meant by :

(1) Metalloids ....
(2) Chemical activity series ....

4-Explain the behaviour of the following elements with water:

(1) Iron .... (2) Silver .... (3) Potassium ....

5-Write the balanced chemical equations which express reaction of :

(1) Carbon dioxide with water.
(2) Magnesium with dil. hydrochloric acid

Lesson 3

Main groups in the modern periodic table

Group 1A (alkali metals)

first group of s-block.

- They are located on the left side of the periodic table.
- **GR: Elements of group (1A) are known as alkali metals.**

Because they react with water forming alkaline solution.

$$2Na + 2H2O \rightarrow 2NaOH + H_2$$

* General properties of alkali metals:

1- They are monovalent elements.**GR.**

Because they have one electron in the outermost energy level.

2- They tend to lose their outermost electrons during the chemical reaction forming positive ion which carries one positive charge.

3- They are active elements, so they are kept under the surface of kerosene or paraffin oil.

- **GR: Sodium and potassium are kept under the surface of kerosene.**

To prevent them from the reaction with moist air as they are active metals.

4- Their chemical activity increases as the atomic size increases.

Therefore, cesium (Cs) is considered the most active metal.

- **GR: because it has the largest atomic size.**

5- They are good conductors of heat and electricity.
6- Most of them has low density:

Group 7A (Halogens)

They are elements of group 17 in p-block.

- Located on the right side of the periodic table before inert gases.

  - GR: Group (7A) is called halogens

Because they react with metals forming salts.

$2K + Br_2 \longrightarrow 2KBr$ (potassium bromide)

* General properties of halogens:

1- They are monovalent elements.

GR : Because their outermost energy level have 7 electrons.

2- They tend to gain one electron during chemical reaction forming negative ions which carry one negative charge.

3- They exist in the form of diatomic molecules (formed of two atoms) as : F2 , Cl2 , Br2 , I2.

4- Their physical state is graduated from gas to liquid to solid:

- ❖ Fluorine and chlorine → gases
- ❖ Bromine → Liquid
- ❖ Iodine → Solid

5- They are active elements; therefore, they don't exist in nature in elementary state but they combine with other elements to form compounds. **(except astatine (At) which is prepared artificially).**

6- Each element replaces the element below it in its salt solution.

$Cl_2 + 2\,KBr \rightarrow 2\,KCl + Br_2$

chlorine potassium bromide potassium chloride bromine

$Cl_2 + 2\,NaBr \rightarrow 2\,NaCl + Br_2$

chlorine sodium bromide sodium chloride bromine

$Br_2 + 2KI \rightarrow 2\,KBr + I_2$

<u>Uses of some elements:</u>

Element	**Its use**
(1) Sodium ($_{11}Na$): (Metal and it is good conductor of heat)	It is used in liquid state to transfer heat from inside the nuclear reactor to outside to obtain vapour required to generate electricity. **- GR: The liquid sodium is used in nuclear reactors.** to transfer heat from inside the nuclear reactor to outside to generate electricity.
(2) Cobalt ($_{60}Co$): (Radioactive cobalt 60)	**It is used in food preservation.<u>GR.</u>** Because it emits gamma rays which prevent the reproduction of microbes but don't harm the man.

(3) Silicon ($_{14}Si$): (Metalloid)	It is used in the manufacture of electronics such as computer because it is semi-conductor (its ability to conduct electricity depends on the temperature)
(4) Liquified nitrogen : (Nonmetal)	**It is used in preservation of cornea of eye. <u>GR.</u>** Due to the decrease of its boiling point (-196°)

Questions on lesson 3

1 Choose the correct answer between brackets :

(1) .... is considered from halogen. (Sodium - Chlorine - Helium - Calcium)

(2) .... in its salt solution.
(Chlorine replaces bromine - Bromine replaces fluorine - Iodine replaces chlorine - Iodine replaces fluorine)

2 Give reasons for :

(1) Elements of group (1A) are known as alkali metal.
....

(2) Liquified nitrogen is used in preservation of cornea of the eye.
....

3 Study the opposite figure which represents a section of the periodic table, then answer.

(1) What is the symbols which indicates the :
(a) Inert gases. (b) Alkali metals.
(c) Halogens. (d) Alkaline Earth metals.

(2) What is the symbol which represents :
(a) The most active metal? (b) The most active nonmetal?

The letters in the table don't represent the actual symbols of the elements

4 Mention one use for each of the following elements in modern technology :

(1) Liquid sodium ....

(2) Silicon ....

(3) Cobalt 60 ....

5 The opposite table explains the properties of three elements, mention the symbol which represents an element from :

(1) Alkali metal ....

(2) Halogen ....

(3) Alkalne Earth metals ....

Element symbol	Behaviour with water	Physical state	Electric conduction	Density (gm/cm^3)
X	dissolve	gas	bad conductor	0.003
Y	react	solid	good conductor	3.59
Z	react instantly	solid	good conductor	0.86

6 Creative Thinking:

Lesson 4

Water

Importance of water:

1- No living organism can live without water.
2- It is used in transportation between cities and countries.
3- It is used in generating electricity by water falls (High Dam in Egypt).

*** The main fields in consuming water internationally are:**

1- agricultural fields 2- industrial fields 3- personal fields.

*** Sources of water:**

1- water areas (seas , rivers , oceans ….)
2- rains 3- Wells 4- springs

*** Structure of water:**

Water molecule is formed by the combination of one oxygen atom with two hydrogen atoms by 2 single covalent bonds , the angle between them is **104.5**° .

Note : Water molecules are linked together by hydrogen bonds.

Hydrogen bond: a weak electrostatic attraction force arises between the molecules of polar compounds

GR: The presence of hydrogen bonds between water molecules.
Beccause the electronegativity of oxygen is higher than hydrogen.

✓ **Notes**:

- Hydrogen bonds are weaker than covalent bonds.
- Hydrogen bond is responsible for abnormal properties of water.

GR: Water molecule is from polar molecules.
Because the difference in electronegativity between its elements is relatively high.

Properties of water

A) Physical properties

1) Water exists in 3 states at normal temperature (solid , liquid , gas) .

2)Water is a good polar solvent:

GR: Most of ionic compounds dissolve in water. E.g.: table salt (NaCl).
B**ecause water is a good polar solvent.**

- Some covalent compounds such as sugar dissolve in water because they form hydrogen bonds with water.
- Some covalent compounds such as oil don't dissolve in water .**GR**

Because oil can't form hydrogen bonds with water molecules.

3) Pure water boils at 100◦C and freezes at 0◦C.

- **GR: The high boiling point and the low freezing point of water.**

Due to the presence of hydrogen bonds among water molecules.

4) Water density decreases on freezing: GR.

Because when temperature decreases than **4◦C** , water molecules gather together by hydrogen bonds forming ice crystals with hexagonal shape , large volume and large number of spaces between them.

5) Water has high latent heat:

It means that water resists the change from one state to another.

6) Water has high specific heat:

It means that water absorbs or loses large amount of heat without changing its temperature.

B) Chemical properties of water

1) Weakness of water ionization:

Ionization: the process of converting the molecules of covalent compounds into ions

- Pure water is a weak ionized material.

- When water ionizes, it gives positive hydrogen ions (H^+) and negative hydroxide ions (OH^-).

2) Pure water has neutral effect on litmus paper .GR.

Because it gives equal numbers of positive hydrogen ions (H^+) and negative hydroxide ions (OH^-) during ionization.

3) Resistance of water to decomposition:

Water doesn't decompose into its elements (oxygen and hydrogen) under normal conditions. This keeps the aqueous solutions inside the cells of living organisms.

Water electrolysis

Q) What is the function of Hofmann's voltameter?

It is used in water electrolysis.

- Oxygen gas (O_2) evolves at **anode** (positive pole)

 and increases the glowing of the splint.

- Hydrogen gas (H_2) evolves at **cathode** (negative pole)

 and burns with a blue flame and pop sound.

- The volume of H_2 is **double** the volume of O_2. (ratio of 2:1)

$$2H_2O \rightarrow 2H_2\uparrow + O_2\uparrow$$

Ex: Calculate the volume of hydrogen gas (H_2) that evolves at the negative pole if you know that the volume of oxygen gas that evolves at the positive pole of Hofmann's voltameter is 2 cm^3.

***Solution*:**

The volume of hydrogen gas = 2 × the volume of oxyge = **4 cm^3**

Water pollution

Water pollution: Adding any substance to water which causes continuous gradual change in water properties affecting the health and the life of living creatures.

Kinds of pollutants:

Natural pollutants	Artificial pollutants
They arise from natural phenomena as : volcanic eruptions , death of living organisms , lightning and thunderstorms.	They arise from different human activities as discharging factories residues in water.

Kinds of pollution:

Kinds of pollution	Its causes (origin) (What happens when...?)	Its harms (damages)
A- Biological pollution:	Mixing animals and human wastes with water.	Infection by many diseases such as : bilharziasis , typhoid and hepatitis.

B- Chemical pollution:	Discharging factories residues and sewage in water.	a) Eating fish with high concentration of lead causes death of brain cells. b) Drinking water with high concentration of mercury causes blindness. c) Arsenic causes liver cancer.
C) Thermal pollution:	Increasing the temperature of water areas that used in cooling nuclear reactors.	Death of marine creatures due to the separation of dissolved oxygen from water.
D) Radiant pollution:	Dumping the atomic wastes and radioactive materials in water.	

<u>* Protecting water from pollution:</u>

1- Don't get rid of factories residues and sewage in water.

2- Developing the stations of water purification.

3- Disinfection of drinking water tanks.

4- Don’t store tap water in plastic bottle .**GR**. Because plastic reacts with chlorine causing cancer.

5- Spreading environmental awareness among people to protect water from pollution.

Questions on lesson 4

#Choose the correct answer between brackets :

(1) All of the following are from the properties of water except .... (neutral on both litmus paper / analysis by heat / increase in volume on heating / polar compound)

(2) There are .... bonds between the water molecule.
(hydrogen / covalent / ionic / metallic)

(3) Alake contains: mineral salts, oxygen , fertilizer , animal wastes , green algea. How many pollutants are in it ? (1 / 2 / 3 / 4)

(4) A liquid boils at 100 ºC, what is the other property which affirm it is a pure water ?
(Sugar dissolves in it / when it freezers , denstiy decreases / neutral on both litmus paper / it evaporates on heating)

#Give reasons for :

(1) Presence of hydrogen bond between water molecule.

...

(2) Pure water doesn't affect litmus paper dye.

...

(3) Although sugar is a covalent compound , it dissolves in water.

...

#What are the results of ?

(1) Water is polluted by the wastes of Man and animal.

...

(2) Storing water in plastic bottles of mineral water

...

Unit Review

#Choose:

(1) Scientists .... discovered the main energy levels in the atom
(Bohr / Mendeleev / Mosely / Hoffman)
(2) Sodium oxide from .... oxides (amphoteric / acidic / nonmetallic / basic)
(3) All the following elements from semimetals except for ....
(teleriun / silicorn / boron / bromine)
(4) The strongest metal lies in the .... group. (2A / 1A / 1B / 7A)

#What is meant by ?

(1)Chemical activity series?...
(2)Water pollution?...
(3)Semimetals?..

#How can you differentiate between magnesium oxide and sulphur oxide?

...
...

#What is the importance of ?

(1)Liquified nitrogen:...
(2)Sodium :...
(3)Water :..

#Give reasons for :

(1)The use of radio active Co 60 in food preservation.
....
(2)Elements of the same group have similar properties.
....
(3)The boiling point of water is high.
....
(4)Alkali metals are kept under kerosene in the lab.
....

#What is the effect of the following on the water environment?

(1)Drainage of factories wastes in rivers and seas.
(2)Using of rivers and seas water as a renewable source for cooling the nuclear reactor.
(3)Mixing of animal and Man wastes with water.

7 *The opposite figure represents a part of the periodic table , symbols represent some elements , study the figure then answer.*

(1)What kind of : X - R - M - D elements.

....

....

(2) Mention the atomic number of element B.

....

....

A																	
N														Z	B	J	
X														L		K	D
	R					M											
E																	

(3) What do the shaded area represent?

....

(4) Mention the symbol which represents.

* *Most active element in group 1A.* ....

* *The higher in the electronegativity in the third period*..

* *The largest size element in the second period*...

Unit 2
Lesson 1

Atmospheric layers

Atmospheric envelope: It is a gaseous envelope rotating with the Earth around its axis and it extends about 1000 Km above the sea level.

Atmospheric pressure: It is the weight of air column of an atmosphere height on a unit area ($1 cm^2$ or $1 m^2$).

***Measuring units of the atmospheric pressure:**

1) Bar 2) Millibar.

1 bar(b) = 1000 millibar (mb)

- **Measuring device of atmospheric pressure:**

It is measured by **barometer** .

-Types of barometers:

1- aneroid 2- altimeter

Normal atmospheric pressure: It is the atmospheric pressure at the sea level and it equals 1013.25 mb.

*** Important notes:**

- The atmospheric pressure depends on the height from sea level.
- **50 %** of the mass of atmospheric air is present in the area between sea level and **3 km** height.
- **90%** of the mass of atmospheric air is present up to **16 km** height above sea level.
- The density of air decreases by increasing the elevation above sea level.

*** Atmospheric pressure maps:**

Isobar: It is the curved lines that join the points of equal pressure in atmospheric pressure maps.

- The centre of low atmospheric pressure areas is represented by **L**.
- The centre of high atmospheric pressure areas is represented by **H**.
- The wind moves from the areas of high atmospheric pressure to the areas of low atmospheric pressure .

*** <u>Layers of atmospheric envelope</u>:**

1- Troposphere 2- Stratosphere   3- Mesosphere   4- Thermosphere

Tropopause: the region between troposphere and stratosphere where temperature remains constant.

Stratopause: the region between stratosphere and mesosphere where temperature remains constant.

Mesopause: the region between mesosphere and thermosphere where temperature remains constant.

P.O.C	***Troposphere***	***Stratosphere***	***Mesosphere***	***Thermosphere***
- Basic information:	- The first layer - It means the disturbed layer. GR> because all weather changes take place in.	- The second layer. -It is called the ozonic atmospheric envelope. GR>**because it contains most of ozone gas**.	- The third layer. - The middle layer and the coldest one.	- The fourth layer. - It is called thermal layer .GR> **because it is the hottest layer of atmospheric envelope.**
Thickness	- Extend about **13** km above sea level. - Its thickness is **13** km.	- Extends from tropopause (at a height of**13** km above sea level) to stratopause (at a height of**50** km above sea level). - Its thickness is **37** km.	- Extends from stratopause (at a height of**50** km above sea level) to mesopause (at a height of**85** km above sea level) - Its thickness is **35** km.	- Extends from mesopause (at a height of **85**km above sea level) to a height of **675**km above sea level . - Its thickness is **590** km.
Temperature	- Decreases with a rate (6.5°C) for each 1 km height until it reaches the lowest value (-60°C) at its top.	-Increases gradually from (-60°C) at the lower part until it reaches (0°C) at its top. GR> **bec. it contains the ozone layer which absorbs the ultraviolet rays coming from the sun.**	- It is the coldest layer. GR>**because the temperature in it decreases with high rate as we go up until it reaches (-90°C) at its top.**	- Increases with high rate as we go up until it reaches 1200°C at its end.
Atmospheric pressure	- Decreases as we go up it becomes 100 mb at its top (0.1 of the normal atmospheric pressure) . GR> **due to the decrease of the weight of air column.**	- Decreases as we go up until it becomes 1 mb at its top (0.001 of the normal atmospheric pressure).	- Decreases as we go up until it becomes 0.01 mb at its top.	

	- All atmospheric phenomena take place in.**GR**>**because it contains 75% of the mass of the air.** - It organizes the Earth's temperature.**GR**>**Because it contains 99% of the water vapour.**	- It contains most of ozone gas so it is called ozonic atmospheric envelope.	- It is much vacuumed (highly rarefied). GR>**because it contains limited quantities of helium and hydrogen gases only.** - Luminous meteors are formed in mesosphere.**GR**> **due to its friction with air molecules.**	- Its upper part contains ionosphere layer (charged ions that extend up to 700km above sea level)
Air movement	- The air moves vertically.**GR**>**because the hot air currents (of low density) move upwards while cold air currents (of high density) move downwards.**	- Pilots prefer to fly their planes in stratosphere. GR> **Because the lower part of it doesn't contain clouds or weather disturbances and the air moves horizontally.**		

Ionosphere: It is a layer that contains charged ions and it has an important role in wireless communications.
Van-Allen belts: They are two magnetic belts surrounding ionosphere and play an important role in scattering the harmful charged cosmic radiations.

Aurora phenomenon: It is a phenomenon that appears as brightly colored light curtains seen from the both poles (North and South poles) of the Earth.
- The atmospheric envelope is inserted with outer space in a region known as **exosphere** in which satellites rotate around the Earth with cameras and telescopes.

Exosphere: It is a region in which the atmospheric envelope is inserted with outer space.

Q) What is the importance of:
1- Satellites ?
Transmits weather condition information and TV programs.
2- Exosphere region ?
Satellites revolve around the Earth in this region.

*** We can calculate the temperature of any height from the sea level in troposphere layer using the following relation:**

The temperature at a certain height
= temperature at sea level – the decreases in temperature (height (km) x 6.5◦C)

The height of a mountain = $\frac{\text{temperature at sea level - temperature at height}}{6.5}$

Review of lesson 1

#Choose the correct answer from statements between brackets:

a -Normal atmospheric pressure equals ……………. millibar.
(1013.25 / 76 / 1.013 / 760)

b-…………. is located between stratosphere and mesosphere.
(Tropopause / Stratopause / Mesopause / Thermopause)

c- Meteors burn in ……………
(mesosphere / ionosphere / exosphere / stratosphere)

#Give reasons for :

a- The lower part of the stratosphere is suitable for flying airplanes.
……………………………………………………………………………………...…..

b- Ionosphere is important for radio stations.
……………………………………………………………………………………...…..

#Mention the importance of each of the following:

a Van Allen's Belts ……………………………………………………………...…………

b Altimeter ……………………………………………………………………………………

c Satellites ……………………………………………………………..…………………..

#What is meant by each of the following ?

a Atmospheric pressure.
……………………………………………

b The aurora phenomenon.
………………………………........……

Lesson 2

Erosion of ozone layer and global warming

First: Erosion of ozone layer

*** Position of ozone layer :**

It is located at a height 20 : 40 km above sea level in the lower part of stratosphere .

GR: Formation of ozone layer in the stratosphere layer.

Because it is the first layer of atmospheric envelope that faces ultraviolet rays coming from the sun and it contains suitable amount of oxygen.

***Structure of ozone layer:**

It is composed of ozone gas (O_3) which consists of 3 oxygen atoms.

***Formation of ozone gas :**

1- Ultraviolet radiation breaks down the bond between the two oxygen atoms in oxygen molecule giving 2 free oxygen atoms.

$$O_2 \rightarrow O + O$$

2- Each free oxygen atom combines with an oxygen molecule forming ozone molecule.

$$O + O_2 \rightarrow O_3$$

***Thickness of ozone layer :**

- Its thickness is **20 km** in the stratosphere layer where the atmospheric pressure is 0.001 mb.
- But the English scientist **"Dobson"** postulated that it has a thickness of **3 mm** only if it was at **STP** [standard temperature (0°C) and normal atmospheric pressure (1013.25 mb)].
- The measuring unit of ozone degree is **Dobson**.
- The natural degree of ozone is 300 Dobson units where:

  100 Dobson = 1 mm thickness

*** Types of ultraviolet rays:**

Near ultraviolet rays (UV-A)	**Medium ultraviolet rays (UV-B)**	**Far ultraviolet rays (UV-C)**
Its wave length is (315:400 nm)	Its wave length is (280:315 nm)	Its wave length is (100:280 nm)
100% of it penetrate ozone layer.	95% of it is absorbed by ozone layer and don't penetrate it. 5% only of it penetrate ozone layer.	100 % of it are absorbed by ozone layer and don't penetrate it.

*** Harms of medium and far ultraviolet rays :**

Living organism	**Harmful effects**
a) Human:	skin cancer – cataract – weakness of immunity system.
b) Amphibians:	spoil eggs – decreasing rate of reproduction.
c) Marine organisms :	- death of plankton (nutrient of marine creatures). - destroying the marine food chains.
d) Terrestrial plants:	- upset the photosynthesis process. - shortage of crops production.

* Importance of ozone layer: GR

- **The ozone layer acts as a protective shield for the living organisms.**

Because it protects the living organisms from the harmful chemical effects of ultraviolet rays.

Erosion of ozone layer: it means thinning or losing parts of ozone layer.

- **GR: Erosion of ozone layer (ozone hole) increases in September every year above the south pole ?**
- **GR: The world celebrates the ozone day in September each year ?**

Because all pollutants collect together as black clouds and are pushed by wind towards south pole making ozone depletion increases.

*Pollutants of ozone layer :

1- Chlorofluorocarbon compounds (CFC):

-They are known commercially as f**reon** which is used in:

a- Cooling substance in air conditioning sets.
b- Propellant substance in aerosols.
c- Flatting substance in making foam baking.
d- Solvent substance for cleaning electric circuits slides.

2- Methyl bromide gas :

Used as an insecticide to preserve stored agricultural crops.

3- Halons:

Used in fire extinguishers.

4- Nitrogen oxides:

Produced from burning of fuel of ultrasound airplanes (Concorde planes).

- **GR: The continuity of ozone layer erosion.**

Due to the continuous using of the pollutants of ozone layer such as freons and halons.

* Protection of ozone layer:

- An international conference was held in **Canada** in **1987** to discuss how to protect ozone layer.
- They reached a group of solutions called " **Montreal protocol** "which was signed by **191** nations. Some of these solutions:

1- Reducing using CFC compounds and find safer alternatives.
2- Stop producing Concorde planes.

- In 1990 , Montreal protocol was modified in London and they decided : " **All nations must ban production or handling CFC compounds , otherwise they won't be allowed to export their goods** "

Second: Global warming

- The intergovernmental panel on climate change **(IPCC)** which follows united nation (UN) showed that global warming is caused by green house effect.

* Global warming : It is the continuous increase in the average temperature of the Earth's near-surface air.

- **Note** : The gases that increase temperature of atmosphere (global warming) are called green house gases.

*** The most important greenhouse gases:**

(1) Carbon dioxide (CO_2)　(2) Chlorofluorocarbon compounds (CFC)
(3) Methane gas (CH_4)　(4) Nitrous oxide (N_2O)
(5) Water vapour (H_2O)

*** Reasons of increasing Carbon dioxide gas ratio in air:**

(1) Fossil fuel burning　(2) Forests fires　(3) Cutting trees

* Greenhouse phenomenon:

It is the trapping of infrared radiation in troposphere layer due to the increase of the ratio of greenhouse gases which causes the increase in planet Earth temperature.

<u>* The negative effects of global warming:</u>

(1) <u>Melting of ice at the two poles causing</u> :

a- Increasing water level in seas and oceans.

b- Coastal areas will drown.

c- Extinction of some polar animals such as polar bear and seals.

(2) <u>Severe climatic changes such as</u>:

a- Tropical hurricanes like Katrina in 2005

b- Destructive floods

c- Drought waves d- Forests fires

<u>* Protection from global warming:</u>

- In **1997** , Kyoto protocol was held in **Kyoto , Japan** by **160** nations and they suggested:

1- Reducing the consumption of fossil fuel to reduce the ratio of bad emission.

2- Searching for more cleaner alternative resources of energy.

Review of lesson (2)

#Replace each of the following statements by suitable scientific term:

a)A molecule is formed forms combining an atom of an element to a molecule of the sameelement.
b)Continuous increase of the average temperature of the air near the surface of the Earth.

#Choose the correct answer from those between brackets:

a) Ozone Layer is measured by a unit called ….........…..
(Km / Dobson / UV / mm^3)
b) All are greenhouse gases except ……........…..
(CO_2 / O_2 / N_2O / CH_4)

#Give reasons for :

a)Formation of Ozone Layer in the stratosphere.
…………………………………………………………………......………………….............
b)Stop building concord airplanes.
………………………….....................………………………………………………......…………

#Write short note about the negative results of global warming.

…………………………....................……………………………………………………………
………………………………………………………………………………………………………
………………………………………………………………………………………………………
………………………………………………………………………………………………………

Unit Review

#Replace each of the following statements by a suitable scientific term:

1)The boundary separating between stratosphere and mesosphere where temperature is rather constant. (………….)
2) Charged layer reflects radio waves. (………….)
3)One of the atmosphere components that its ratio increased in recent years to reach about 0.038%. (………….)
4)A type of ultraviolet radiation that is absorbed completely (100%) in the Ozone Layer. (………….)

#Complete the following phrases:

1) The highest temperature layer in the atmosphere is ………. and the least temperature one is …………..
2) Most of weather features occur in …………. layer whereas satellites swim through the ……………. layer.
3) Ultraviolet radiation has a …………. effect, and the infrared radiation has a ………. effect.
4) Among the pollutants of the Ozone Layer are ………….. compounds that are used in air conditioning sets and …………… compounds that are used in fire extinguishers.

#Illustrate with formulas only the role of ultraviolet radiation in the formation of Ozone gas.

…………………………………………………………………………………………
…………………………………………………………………………………………..

#An aeroplane captain announced that the atmospheric pressure outside the aeroplane is90 millibar. In which layer of the atmosphere was the plane flying? Why?

…………………………………………………………………………………………
…………………………………………………………………………………………

#Compare between mesosphere and thermosphere in terms of temperature, importance,and air pressure.

…………………………………………………………………………………………
…………………………………………………………………………………………

#Calculate the height of a mountain if the temperature at its foot is 30º C and at its top is(-6 º C)

…………………………………………………………………………………………
…………………………………………………………………………………………

Unit (3)

Lesson 1 : Fossils.

Fossils: They are traces and remains of old living organisms that are preserved in sedimentary rocks.

Traces: Traces indicate the activity of once an old living organism during its life.

-Ex: Worm's tunnels - Dinosaur's foot print.

Remains: Parts indicate the remains of once an old living organism after death.

-Ex: Remains of shark's teeth - Remains of dinosaur's skull.

Types of fossils:

(1) Fossil of complete body (2) Cast (3) Mold (4) Petrified fossils

1- Fossil of complete body:

It is a type of fossils which is formed as a result of the rapid burying of the organism in a medium preserves it from decomposition as snow and amber.

- Examples of complete body fossil:

a- Mammoth fossil:

b- Amber fossil:

* **Amber:** It is the solidified resinous matter which was secreted by pine trees in old geologic ages.

(2) Cast: It is the replica of the internal details of a skeleton of once an old living organism.

Ex: Ammonite - Nummulite - Trilobite.

(3) Mold:

It is the replica of the external details of a skeleton of once an old living organisms.

-Ex: Mold of ferns - Mold of fish.

(4) Petrified fossils: They are fossils , in which minerals replace the organic matter of organism part by part leaving the shape without any change.

-Examples of petrified fossils:

Dinosaur's tooth - Dinosaur's eggs - Petrified wood

Petrified wood : They are fossils that are formed as a result of replacing the organic matter of wood by silica part by part giving us details about the life of an old plant.

Petrification: It is the process of replacing the wood material of trees by silca part by part to form petrified wood.

*** Suitable conditions for fossil formation (preservation) :**

1- Presence of hard skeleton of organism.

2- The rapid burying of the organism in a medium preserves it from decomposition.

3- The existence of suitable medium in which the mineral materials replace the organic material of the organism.

Importance of fossils:

(1) Age determination of sedimentary rocks:

Index fossil indicates the age of sedimentary rocks

Because the age of rocks is the same age of fossils existed in them.

Index fossil : They are fossils of organisms that had lived for a short period of time and a wide geographic distribution then became extinct.

(2) Figuring out the paleo environment:

- **Q. Mention the importance of:**

A) Nummulite fossils

- They indicate that Gabel El-Mokattam was a seafloor more than 35 million years ago.

- They are found in the limestone rocks of Gabel El-Mokattam.

B) Ferns fossils:

- Indicate that the environment where they lived was hot and rainy tropical environment.

C) Coral fossils:

- Indicate that the environment where they lived was clear warm shallow sea.

(3) Studying life evolution :

Fossil record: It is fossils that exist in the rocks of different areas that indicate the extinction and evolution of organisms.

*** By studying the fossil record , it showed that:**

1- The life started first in sea then on land .

2- Organisms developed from simple to complicated as :

- Algae appeared before mosses and ferns.

- Angiosperms appeared before gymnosperms.

- Invertebrates appeared before vertebrates.

- Fish were the first vertebrates that appeared then → Amphibians then → reptiles then → Birds and mammals.

- **Important note:**

Archaeopteryx fossil is considered a link between **reptiles** and **birds .**

(4) Petroleum exploration:

The existence of **microfossils** such as ***foraminifera*** and ***radiolaria***could point to:

- The conditions are suitable to form petrol.

- The age of rocks in exploratory wells.

Review of lesson 1

1- Write the scientific term for each of the following statements:

(1)Remains of old organisms that lived in the past for a certain period and then became extinct.

(2)Replacing, part by part, the wood material of trees by silica to form petrified woods.

2- Complete the following phrases:

(1) Archaeopteryx represents the link between ……………..
and...………….....................

(2) Fossils are used in …………… exploration and determining the age of……..

3-Choose the correct answer from between brackets:

(1) …………….. is an example of microfossils.
(Mammoth / Ferns / Foraminifera / archaeopteryx)

(2) Complete fossils of insects are found preserved in
(ammonites / amber / igneous rocks / ambergris)

4-Mention the importance of each of the following:

(1)Coral fossil……………………………………………………..........................……..

(2)Nummulites fossil……………………….................………..…………………........

5-What is the difference between ?

(1) Remains and trace.

……………………………………………………...………………….................

(2) Mold and cast.

……………………………………………………….………………..................…

6-Give reasons for:

(1) Naming the petrified forests with wood mountain.

…………………..……………………………………………………….............…

(2) Gebel El-Mokattam was once a sea floor more than 35 million years ago.

………………………………………………………………………………………

………………………………………………………………………………………

Lesson 2

Extinction

Extinction: It is the continuous decrease without compensation in the number of species until all members of species die out.

The moment of extinction : It is the date of death of the last individual of the species.

*** Using fossils to indicate extinction:**

*** Factors causing extinction :**

Causes of old extinction	Causes of recent extinction
1- Meteors impact with Earth. 2- The onset of a long glacial age. 3- Emission of poisonous gases from volcanoes.	1- Destroying natural habitat . 2- Over hunting. 3- Environmental pollution. 4- Climatic changes and natural disasters.

- * Examples of extinct species in old time

1- Dinosaur 2- Mammoth

*** Examples of extinct species in the recent time :**

Extinct species in the recent time	Cause of extinction
1. Dodo bird:	**- Extinction of dodo bird** Because it was an easy target for hunters due to: a- Has small wings so it can't fly. b- Has short legs so it can't run fast.
2- Quagga: - It is a midway between horse and zebra.	**- Extinction of quagga** Due to the continuous hunting.

The endangered species

The international union for conservation of nature **(IUCN)** issues every year a **RED LIST** that includes the endangered species.

Examples of endangered species:

Endangered species	Causes of endanger
1- Panda bear:	**- Panda bear is endangered** Due to:1- Weakness rates of reproduction. Rareness of bamboo plant (its only food) that doesn't blossom except once every 100 years.
2- Rhinoceros:	**- Rhinoceros is endangered** Due to: 1- Changing its habitats into cultivated lands. 2- Over hunting for using its horns in some medical purposes.
3- Bald eagle: **- Naming the bald eagle by this name** Because its head is covered by white feathers which make it look like bald.	**- Bald eagle is endangered** Because it feeds on fish that contain poisonous matter that is dumped in rivers.
4- Ibis bird:	**- Ibis bird is endangered** Due to the loss of its nests after building the High Dam.
5- Papyrus plant:	**- Papyrus plant is endangered** Due to drying of swamps where they grow.

Ecosystem: It is a natural area of living organism and non-living things.

Food chains: It is a path of energy that transmits from a living organism to another in the ecosystem

Kinds of ecosystem:

Simple ecosystem	Complicated ecosystem
It is an ecosystem that has few members and it is severely affected by the absence of one of its species.	It is an ecosystem that has multiple members and it isn't affected much by the absence of one of its species.
- Ex: Desert ecosystem	**- Ex:** Tropical forests ecosystem.

Ways to protect living organisms from extinction:

1- Issuing rules to control hunting in land, sea and air.

2- Increasing the awareness about the importance of natural life.

3- Rearing and reproducing the endangered species and send them back to their native habitats.

4- Establishing gene banks for the much endangered species.

5- Establishing natural protectorates.

Natural protectorates:

They are safe areas established to protect endangered species in their homeland.

*** The important world's protectorates:**

P.O.C	Bluestone protectorate	Panda protectorate	Ras Mohamed protectorate
*** Location :**	U.S.A	North eastern China	South Sinai governorate, Egypt.
*** Protected kind:**	Grey bear	Panda bear	Rare species of coral reefs, coloured fish and numerous of rare plants and animals.

Review on lesson 2

#Choose the correct answer from between brackets:

(1)……….. indicate(s) extinction.
(Fossils / Protectorates / Evolution / Ecological equilibrium)

(2)………. protectorate is the first established natural protectorate in Egypt.
(Saint Cathrine / Ras Mohamed / Wadi Hetan / Petrified forest)

#Write the scientific term for each of the following statements:

(1) The death of all members of species of living organisms. (………..…)

(2) Extinct animal has a wolf's head, a dog's tail and a tiger's skin. (………..…)

#Explain the effect of extinction of a species of living organisms on:

(1) Simple ecosystem ………………………………………………………………

(2) Complicated ecosystem ………………………………………………………

#Mention what characterize each of the following:

(1)Ras Mohamed protectorate.

(2)Wadi Hetan area.

#Exclude the unsuitable word and mention what the rest has in common:

(1)Dodo / Quagga / Bald eagle / Tasmanian cat.

……………………………………………………………………………………

(2)Panda / Rhinoceros / Golden frog / Bald eagle

……………………………………………………………………………………

#Give reasons for:

(1)Removing trees of tropical forests is one of the most important factors ofextinction.

……………………………………………………………………………………

(2)The desert ecosystem is significantly affected by the absence of one of its species.

……………………………………………………………………………………

First Term Review

1-Choose the correct answer between brackets :

1-.......... form positively charged ions when they enter in the chemical reactions.
(Inert gases - Nonmetal - Halogens - Alkali metals)
2-The elements of group (17) are called ....
(alkali metals - halogens - inert gases - alkaline Earth metals)
3-Meteors are formed in ....
(exosphere – thermosphere – mesosphere – stratosphere)
4-…....... is one of the most important causes of the recent extinction age.
(Volcanic eruption – Falling of icebergs – Falling of meteorites – Overhunting and environmental pollution)

2-Write the chemical equations representing the following :

1- Dissolving of magnesium oxide in water.
....
2-The reaction between chlorine gas and potassium bromide.
....
3-The electrolysis of water.
....

3-Mention one difference between each of :

1- Flourine molecule and helium molecule.
....
2-Natural and industrial water pollutants.
....
3-Troposphere and stratosphere.
………
4-Simple and complicated ecosystems.
…….

4-Give reasons :

1-Water molecule is from the polar molecules.
....
2-Sodium is kept in kerosene.
3-The lower part of stratosphere is suitable for plane flying.
....

4-The bald eagle is one of the endangered species.

…………………………………………………………………………………………………

5-To who are these works/achievements attributed ?

1- The discovery that the nucleus of the atom contains positively charged protons.

....

2-The discovery of the existence of two magnetic belts around planet Earth.

....

1 Cairo Governorate

Leaders Language School

Answer the following questions :

Question 1

A Complete the following sentences :

1. Mosely put .... and .... series below his periodic table.
2. During chemical reaction, metals tend to .... outer electrons taking the structure of the nearest .... nobel gas.
3. Iodine is found in .... state, while bromine is found in .... state.
4. .... were the first vertebrate appeared and followed by ....

B Write the scientific term of each of the following sentences :

1. Two magnetic belts help in scattering of harmful cosmic radiations away from the Earth.
2. An ozone pollutant that is used as an insecticide.
3. A water pollutant that causes death of brain cells.
4. Descending arrangement of metals according to their chemical activity.

C Represent the next reactions by balanced chemical equations :

1. Reaction of magnesium oxide with water.
2. Reaction of bromine with potassium iodide.

Question 2

A Give reasons for :

1. Mammoth fossil is preserved as a complete body fossil.
2. The simple ecosystem is severely affected by absence of one of its species.
3. Increasing CO_2 gas percentage in the atmosphere.
4. Cesium is the strongest metal in the modern periodic table.

B Cross out the odd word, then write the scientific term of the rest :

1. Sodium / Cesium / Lithium / Chlorine.
2. Silicon / germanium / Magnsium / Tellurium.
3. Freon / Water vapour / Halons / Nitrogen oxides.
4. Aneroid / Barometer / Hofmann's voltameter / Altimeter.

C Problem :

Find the temperature at a point of height 3000 meters above the sea level. if the temperature at the sea level is (30°C).

Question 3

A Choose the correct answer :

1. .... layer in atmosphere that is suitable for flying planes.
   a. Troposphere b. Stratosphere c. Thermosphere d. Mesosphere
2. .... discovered the main energy levels in the atom.
   a. Bohr b. Mendeleev c. Mosely d. Rutherford
3. .... causes blindness when its ratio increases in drinking water.
   a. Arsenic b. Iron c. Lead d. Mercury
4. .... is used in preservation of eye cornea.
   a. Liquefied sodium b. Liquefied nitrogen
   c. Silicon d. Cobalt

B Write one importance of :

1. Exosphere layer.
2. Ras Mohamed protectorate.
3. Foraminifera microfossil.
4. Ferns fossil.

C Locate the following elements in the modern periodic table :

1. $_{19}K$
2. $_{10}Ne$

Question 4

A What happens when ... ?

1. The sediments fill up the empty snail, then the outer shell is decomposed.
2. We go from up to down in group 7A.
3. Hydrogen bonds were absent between water molecules. (concern boling point).
4. Halogens react with metals.

B Put (✓) or (✗), then correct the false one (s) :

1. Meteors are formed in the thermosphere layer. ( )
2. Infrared radiation has chemical effect. ( )
3. Petrified fossil was formed by replacing organic substances with minerals. ( )
4. Dinosaurs were extinct due to over hunting. ( )

C **Mention the number representing each of the following :**

1. Thickness of stratosphere layer.
2. Temperature at the top of mesosphere.

2 Cairo Governorate — Manor House International School

Answer the following questions :

Question 1

A **Complete the following sentences :**

1. Mendeleev arranged the elements ascendingly according to ....
2. The highest temperature layer in the atmosphere is ....
3. $MgO + H_2O \longrightarrow$ ....
4. Dodo bird is from the .... bird.

B **Correct the underlined words :**

1. **Copper** reacts instantly with water and hydrogen gas evolved.
2. Panda bear is considered from **extinct** species.
3. **Inert gases** have the properties of metals and nonmetals.
4. All weather phenomena like rain, wind and clouds occur in the **ionosphere layer**.

C **What happen when ... ?**

Decreasing the temperature of water to less than 4°C.

Question 2

A **Choose the correct answer :**

1. .... replace(s) the wood organic material, part by part of an old tree.
   a. Plastic b. Iron c. Minerals d. Copper
2. Ozone layer is found in .... layer.
   a. troposphere b. mesosphere c. thermosphere d. stratosphere
3. The density of ice is .... the density of water.
   a. less than b. more than c. equal to d. double of
4. The atomic number of an element that exists in group (7A) and period (2) is ....
   a. 12 b. 7 c. 9 d. 17

B **Put (✓) or (✗) in front of the following statements :**

1. The atomic size decreases in the same group as atomic number increases. ( )
2. The air moves horizontally in the lower part of stratosphere. ( )
3. Amber is a complete body fossil. ( )
4. Halogens are monovalent elements. ( )

C Problem :

If the temperature at the sea level is 20.6°C. Find the temperature at the top of a mountain of height 2 km above Earth's surface. [Don't forget the rule].

Question 3

A Write the scientific term of each of the following sentences :

1. It's the addition of any substance to the water which causes continuous gradual change in water properties affecting the health and the life of living creatures.
2. The death of all members of species of living organisms.
3. A device that is used to measure the elevation above the sea level.
4. The radioactive element that is used in food preservation.

B Mention one example for each of the following :

1. Halogen is found in solid state.
2. Fossil of a complete body.
3. Covalent compound cannot dissolve in water.
4. The strongest metallic element.

C Locate the following elements in the modern periodic table showing your steps :

1. $_{13}Al$ 2. $_{10}Ne$

Question 4

A Determine the odd word :

1. Rhinoceros / Panda bear / Quagga / Bald Eagle.
2. Sodium / Potassium / Silver / Iron.
3. Sugar / Animal wastes / Lead / Mercury.
4. Bromine / Chlorine / Nitrogen / Fluorine.

B Mention the importance of :

1. The ozone layer.
2. The liquefied nitrogen.
3. The Hoffman's voltameter.
4. The aneroid.

C Give a reason for :

Solution of carbon dioxide changes the color of blue litmus paper into red. [Write your answer and the chemical equation that represents this reaction].

3 Cairo Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. The strongest nonmetal lies in group ...., while the strongest metal lies in group ....
2. .... is the coldest layer in the atmosphere, while .... is the hottest layer.
3. $2Mg + O_2 \xrightarrow{\Delta}$ ....
4. .... is from extinct mammals, while .... is from endangered mammals.

B Mention one example for :

1. A covalent polar compound.
2. A device used to measure the atmospheric pressure.
3. An endangered plant.
4. Halogen in a liquid state.

C Problem :

If the volume of the gas evolved above the cathode of Hofmann's voltameter is 10 cm^3.
Calculate the volume of the gas evolved above the anode.
And mention the name of the gas above the anode and the gas above the cathode.

Question 2

A Choose the odd word out, then write the scientific term of the others :

1. $_9F$ / $_6C$ / $_{35}Br$ / $_{17}Cl$.
2. CO_2 / O_2 / N_2O / CH_4.
3. Cast / Fossil of a complete body / Fossil record / Mold.
4. Dodo bird / Bald eagle / Ibis bird / Rhinoceros.

B Put (✓) or (✗) in front of the following statements :

1. The modern periodic table consists of (17) horizontal periods and (8) vertical groups. ( )
2. Potassium oxide is considered from basic oxide. ( )
3. Ozone molecule consists of four oxygen atoms. ( )
4. Temperature decreases by 6.5°C at 2 km above the sea level. ( )

C Compare between :

The Florine ($_9F$) and Cesium ($_{55}Cs$)
(According to : 1- The kind of each of them. 2- Atomic size of each of them.)

Question 3

A Choose the correct answer :

1. Ozone degree is measured in a unit that is called ....
   a. Km b. nm c. Dobson d. Pm
2. Eating fish which contain high concentration of .... causes the death of brain cells.
   a. mercury b. arsenic c. lead d. iron
3. .... is an example of microfossils.
   a. Fern b. Foraminifera c. Mammoth d. Amber
4. The upper (3) layers of atmosphere contain .... of water vapor.
   a. 1% b. 25% c. 75% d. 99%

B Write the scientific term of each of the following sentences :

1. An arrangement of metals in a descending order according to their chemical activity.
2. A phenomenon looks like a colorful light curtains seen at the two poles of the Earth.
3. Remains of old living organisms that are preserved in sedimentary rocks.
4. The continuous increase of the average temperature of the air near the surface of the Earth.

C What happens if ... ?

1. Putting a piece of sodium in water.
2. Harmful cosmic radiations collide with the ionosphere.

Question 4

A Choose from column (B) what suits it in column (A) in the following tables :

1-

(A) Probably harms	(B) Responsible pollutant
1. Blindness	a. sodium.
2. Death of brain cells	b. lead.
3. Cancer of liver	c. mercury.
4. Bilharzia and hepatitis	d. mixing water with human and animal wastes.
	e. arsennic.

1. .... 2. .... 3. .... 4. ....

2-

(A)	(B)
1. Liquid sodium 2. Liquefied nitrogen 3. Cobalt 60 4. Silicon slides	a. is used in preservation of food. b. is used in manufacture of electronic device. c. is used in nuclear reactor. d. is used to easy studying of the chemical and physical properties of elements. e. is used in preservation of the eye cornea.

1. .... 2. .... 3. .... 4. ....

B Fill the following spaces :

Li
Na
X
Rb
Y
Fr

1. Name of this group is ....
2. Atomic number of element (X) = ...
3. Atomic size of element (Y) is .... than atomic size of element (X).
4. The atoms of elements of this group form .... ion in the chemical reactions.

C Locate the following elements in the modern periodic table :

1. $_{10}Ne$
2. $_{8}O$

4 Cairo Governorate

El-Helmia Official Language School

Answer the following questions :

Question 1

A Complete the following sentences :

1. Ultraviolet rays have .... effect, while infrared rays have .... effect.
2. Mendeleev arranged elements according to their ...., whereas Moseley arranged elements according to their ....
3. The hottest atmospheric layer is ...., while the coldest layer is ....
4. Elements of group (1A) are called ...., while elements of group (7A) are called ....
5. The strongest metallic element is ...., and the strongest nonmetallic element is ....

B Mention the importance of :

1. Cobalt 60.
2. Altimeter.

Question 2

A Give reasons for :

1. Pilots prefer to fly their planes in the lower part of stratosphere layer.
2. Liquefied nitrogen is used in preservation of the eye cornea.
3. Desert is a simple ecosystem.
4. Establishing natural protectorates.

B **Locate the following elements in the modern periodic table :**

1. $_{17}Cl$ 2. $_{18}Ar$

C **Compare between :**

Troposphere and stratosphere, according to the atmospheric pressure at its top and its thickness.

Question 3

A **Write the scientific term of each of the following sentences :**

1. It is a weak electrostatic attraction force arises between molecules of polar compounds.
2. The ability of atom in the covalent molecule to attract the bond electrons to itself.
3. Remains and traces of old living organisms that lived in the past for certain period then became extinct.
4. Atomspheric layer that plays an important role in wireless communication.

B **What is meant by ... ?**

Atmospheric pressure.

C **Complete the following equations :**

1. $2KBr + Cl_2 \longrightarrow$ ....
2. $2Na + 2H_2O \longrightarrow$ ....

Question 4

A **Choose the correct answer :**

1. Ozone layer is found in .... layer.
   a. troposphere b. mesosphere c. stratosphere
2. .... is an example of extinct animal in the old age.
   a. Dodo bird b. Quagga c. Dinosaur
3. .... is the measuring unit of the degree for ozone layer.
   a. Picometer b. Dobson c. Nanometer
4. .... protectorate is the first natural protectorate established in Egypt.
   a. Wadi Hetan b. Ras Mohammed c. Saint Catherine

B **Calculate :**

The temperature at the top of a mountain, if you know that the temperature at its foot is 27°C and its height is 3 km.

C **What happens when ... ?**

1. One of species in a complicated ecosystem extincted.
2. Concentration of mercury increases in drinking water.

5 Cairo Governorate

St. Joseph School

Answer the following questions :

Question 1

A Give reasons for :

1. El-Mokattam mountain was a sea floor more than 35 million years ago.
2. The atmospheric pressure decreases by increasing the altitude above the sea level.
3. Pilots prefer to fly their planes in the lower part of stratosphere.
4. The atomic size increases as we go down through the same group in the modern periodic table.

B Complete the following sentences :

1. The .... layer protects the Earth from celestial rocky masses.
2. $2K + Cl_2 \longrightarrow$ ....
3. .... is an example of endangered species.
4. .... are example of metalloid elements.

C Write the contributions of the following scientists in chemistry :

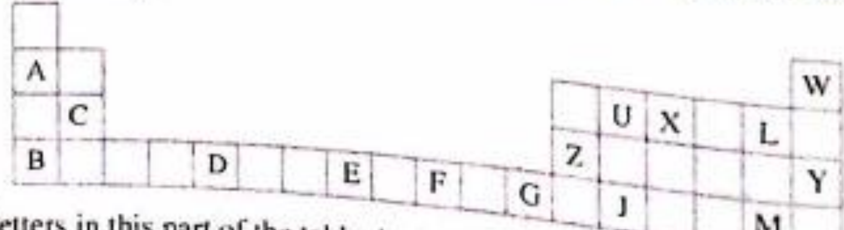
1. Bohr.
2. Rutherford.

Question 2

A Choose the correct answer :

1. .... is example of microfossils.
   a. Foraminifera b. Dinosaur c. Papyrus plant d. Dodo bird
2. Burning carbon in oxygen produces ....
   a. CO b. CO_2 c. H_2CO_3 d. (a & c)
3. .... used in fire extinguisher.
   a. Halons b. CFC_s compounds c. Nitrous oxides d. Oxygen
4. The crystals of ice take .... shape.
   a. quintet b. quadrilateral c. octogenarian d. hexagonal

B Study the following figure which represents a section of the periodic table, then answer the following :



[NB. The letters in this part of the table don't represent the actual symbols of elements]

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What is/are the symbol which indicates the ... ?

1. Inert gases.
2. Halogens.
3. d-block elements.
4. Higher active metal.
5. Highest electronegativity element.

C Give an example of each of the following :

1. Extinct species in the old geological ages.
2. Greenhouse gases.

Question 3

A Write the scientific term of each of the following sentences :

1. It is the weight of air column of an atmospheric height on a unit area.
2. It is the addition of any substance to the water, which causes continuous gradual change in water properties affecting the health and the life of living creatures.
3. The remains or traces of organisms that lived in the past and were preserved in sedimentary rocks.
4. It is curved lines that join the points of equal pressure in atmospheric pressure maps.
5. The continuous decrease without compensation in the number of a certain species of living organisms until members of species dies out.

B 1. Write the balanced chemical equations representing the following reactions :

1. The reaction between magnesium and dilute hydrochloric acid.
2. The reaction between bromine and potassium iodide.

2. Locate the following elements in the modern periodic table :

1. $_{20}Ca$
2. $_{1}H$

C Write the important of each of the following :

1. Ozone layer.
2. Cobalt 60.
3. Hofmann's voltameter.
4. Moseley's periodic table.
5. Ionosphere.

Question 4

A Compare between :

1. Mold and Cast (according to definition and example).
2. Aneroid and Altimeter (according to its importance).

B Correct the underlined words :

1. Each period ends with **a nonmetal**.
2. When water freezes its density **doesn't change**.
3. The normal degree of ozone is **200 Dobson**.
4. **Panda bear** is one of extinct species.
5. **Thermosphere layer** contains 75% of the mass of the atmospheric air.

C **Mention the atomic number of each of the following elements :**

1. The element, which is located in the second period and in group (7A).
2. The element, which is located in the third period and in group (1A).
3. The element, which is located in the first period and in group (18).

6 Giza Governorate — Egypt Dream Language School

Answer the following questions :

Question 1

A **Complete the following sentences :**

1. .... is a type of barometers used to determine the possible day weather, while .... is instrument used to measure the altitude of airplanes above the sea level.
2. The coldest layer of the atmospheric envelope is called ...., while all weather phenomena are present in the .... layer.
3. When temperature of water becomes less than 4°C its density ...., while its volume ....
4. .... is an endangered bird, while .... is an endangered mammal.

B **Write the scientific term :**

1. The addition of any substance to water, which causes continuous gradual change in water properties affecting the health and life of living organisms.
2. Trapping of infrared radiation in troposphere due to the increase in the percentage of greenhouse gases.
3. The death of all members of species of living organisms.
4. Thinning of ozone layer above the south pole.

C **Problem :**

Find the temperature at a point of height 10 km above the sea level, if the temperature at the sea level is 24°C.

Question 2

A **Choose the correct answer :**

1. The element whose atomic number equals 18 is considered .... element.
   a. transition b. inert gas c. metallic

2. In the periodic table, the elements which are similar in their chemical properties are located in the same ....

   a. period. b. energy level. c. group.

3. Water has a/an .... effect on litmus paper.

   a. acidic b. neutral c. basic

4. In water electrolysis, if the volume of the evolved gas above the cathode is 8 cm^3, so the volume of the evolved gas above the anode is .... cm^3.

   a. 16 b. 8 c. 4

B You have 3 elements X, Y and Z of atomic numbers 2, 9 and 12 respectively, answer the following :

1. Determine their location in the modern periodic table.
2. Calculate the atomic number of the element, which follows element Z in the same group.

C Give an example of each of the following :

1. Greenhouse gases. 2. Simple ecosystems.

Question 3

A Give reasons for :

1. The temperature at the top of a mountain is less than that at its foot.
2. Stop producing concorde aeroplanes.
3. Oil doesn't dissolve in water.
4. Wadi El-Hetan is considered as the most important area in Wadi Al-Rayan protectorate.

B Correct the underlined words :

1. The angle between the two covalent bonds of water molecule is **180°**.
2. The ozone layer extends from **20 to 30 km** above the sea level.
3. Pilots prefer to fly their aeroplanes in the lower part of **mesosphere**.
4. Magnesium reacts with dilute HCl and Cl_2 gas evolves.

C What is meant by ... ?

1. The chemical activity series. 2. Food web.

Question 4

A Complete the following sentences :

1. The ultraviolet radiation has .... effect, while infrared radiation has .... effect.

2. Elements of s-block are located on the .... side of the periodic table, and they are arranged in two groups which are .... and ....
3. The valency of group 7A elements is ....
4. Bromine exists in a .... state, while iodine exists in a .... state.

B **Choose out the odd symbol or word :**

1. Na_2O / MgO / CO_2 / CaO
2. F_2 / Cl_2 / Br_2 / C
3. Cast / Mold / Fossil record / Petrified fossil.
4. Nitrogen oxides / Water Vapor / Freon / Halons.

C **What happens when ... ?**

1. Harmful cosmic radiations collide with ionosphere.
2. Burning a magnesium strip inside a test tube that contains oxygen.

7 . Giza Governorate
6th October Directorate

Answer the following questions :

Question 1

A **Complete the following sentences :**

1. Elements of group (7A) are called .... , and they have a valancy equals ....
2. F-block consists of 2 series which are called .... and ....
3. Thickness of ozone layer is .... Dobson or .... mm.
4. .... is considered as a linkage between birds and reptiles.
5. The strongest metal is .... , and strongest nonmetal is ....
6. The hottest atmospheric layer is ....

B **Give reasons for each of the following :**

1. Troposphere organizes the temperature of the Earth.
2. Group (1A) are called alkali metal.
3. In each group of the modern periodic table, the elements are similar in their chemical properties.

C **How can you locate the following elements in the modern periodic table ?**

1. $_{11}Na$
2. $_{2}He$

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Question 2

A Put (✓) or (✗) in front of the following statements :

1. The infrared rays has a chemical effect. ( )
2. Water decomposes by electrolysis into oxygen and hydrogen. ( )
3. Acidic oxides turn litmus paper into blue. ( )
4. The first protectorate in Egypt is Blue Stone protectorate. ( )
5. Fossil record indicates that life is started on land then in sea. ( )
6. The s-block in the modern periodic table contains 2 groups. ( )

B Write the use (importance) for each of the following :

1. Cobalt 60. 2. Altimeter. 3. Van-Allen Belts.

C If you know the volume of the gas that evolves at the anode during water electrolysis is 30 cm^3, calculate the volume of the gas that evolves at the cathode and write the name of the two gases.

Question 3

A Write scientific term :

1. Elements that have properties of metals and nonmetals.
2. Ability of the atom to attract the electrons of the covalent bond towards itself.
3. Weak electrostatic attraction that arises between molecules of water.
4. Continuous increase in the Earth temperature.
5. Dying out of all member of certain species.
6. The scientist who discovered the main energy levels.

B Complete the following equations :

1. $CO_2 + H_2O \longrightarrow$ ....
2. $2H_2O \xrightarrow{\text{electrolysis}}$ .... + ...
3. $Br_2 + 2KCl \longrightarrow$ ....

C Cross out the odd one :

1. F_2 / Br_2 / Cl_2 / Na
2. s-block / p-block / d-block / m-block.

Question 4

A Choose the correct answer :

1. Metal oxides are called .... oxides.
   a. acidic b. amphoteric c. basic d. salty
2. Transition elements start to appear in period number ....
   a. 2 b. 4 c. 3 d. 6
3. The region between mesosphere and thermosphere is called ....
   a. mesopause. b. stratopause. c. thermopause. d. troposphere.
4. A type of ultraviolet rays that is absorbed completely (100%) in ozone layer is .... UV.
   a. far b. near c. medium d. thermal
5. All the following are endangered species, except ....
   a. panda bear. b. quagga. c. bald eagle. d. ibis bird.
6. .... is from nobel gases.
   a. Cesium b. Sodium c. Neon d. Potassium

B Give an example for each of the following :

1. Extinct animal. 2. Greenhouse gas. 3.Cast fossil.

C Compare between : Biological pollution and Chemical pollution of water (regarding harms).

8 Giza Governorate — Kerdasa Directorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. Mendeleev arranged elements in an ascending order according to their .... , while Moseley arranged the elements in an ascending order according to their ....
   a. atomic number – atomic weight. b. atomic weight – atomic number.
   c. atomic weight – atomic weight. d. atomic number – atomic number.

2. The transition elements starting to appear from period .... , and they lie at the .... of the periodic table.

a. 3–upper b. 4–middle c. 4–upper d. 4–bottom

3. The atomic number of the element which lies in period (3) and group (7A) is ....

a. 15 b. 17 c. 10 d. 7

4. Each period in the modern periodic table starts with ...., and ends with ....

a. metal–nonmetal. b. metal–metalloid.

c. metal–metal. d. metal–Nobel gas.

B Arrange the following ascendingly :

1. $^{23}_{11}Na$, $^{39}_{19}K$, $^{27}_{13}Al$, $^{24}_{12}Mg$ (according to their atomic size)

2. $_{9}F$, $_{35}Br$, $_{53}I$, $_{17}Cl$ (according to their nonmetallic properties)

3. Fish, Mammoth, Trilobite, Archaeopteryx.

(according to their appearance on the life)

4. Types of ultraviolet rays : (Far, Medium and Near)

(according to their wave length)

C Problem :

Calculate the collected volume of the gas at the negative pole, if you know that the collected volume of the gas at the positive pole was 5 cm^3.



Question 2

A Complete the following sentences :

1. .... is an extinct bird, while .... is an endangered bird.
2. .... is radioactive isotope which is used in preservation of food because it emits .... ray.
3. The type of bonds between water molecules are .... , while the type of bonds between its atoms are ....
4. If the atomic number of an element is 15 , this means that it lies in period number .... and group number ....

B Show by a chemical equations, How to obtain each of the following :

1. Sodium chloride from sodium metal.
2. Magnesium hydroxide from magnesium metal.

C Classify each of the following :

1. $_4Be$, $_1H$, $_5B$, $_8O$ (into : metals , nonmetals and metalloids).
2. Dinosaur's eggs fossil – Fern fossil – Ammonites fossil – Amber fossil. (into : different types of fossils)

Question 3

A Complete the following table :

	Stratosphere	Troposphere
Thickness	.... (1)	.... (2) ....
Temperature (at its top)	.... (3)	.... (4) ....
Pressure (at its top)	.... (5)	.... (6) ....
Air movement	.... (7)	.... (8) ....

B Give reasons for each of the following :

1. Elements of the same group in the modern periodic table have the same chemical properties.
2. Sulphur dioxide is an acidic oxide.
3. Stopping manufacturing of concord aeroplanes.
4. Liquefied nitrogen is used in preservation of cornea of the eye.

C Mention the use (importance) of each of the following :

1. Altimeter.
2. Ionosphere.

Question 4

A Write the scientific term for the following statements :

1. The ability of the atom in a covalent molecule to attract the electrons of the bond.
2. Safe areas which established to protect the endangered species in their homeland.
3. The mammal that is considered the midway between horse and zebra.
4. The path of energy from a living organism to another in an ecosystem.

B Complete the following chemical equations :

1. $Br_2 + KCl \longrightarrow$ ....
2. $Mg + 2HCl \longrightarrow$ .... + ...
3. $2Na +$ .... $\longrightarrow$ .... $+ H_2$
4. .... $+ H_2O \longrightarrow H_2CO_3$

C Problem :

Find the temperature at a point of height 3.5 kilometers above the sea level. if the temperature at the sea level is 23° C.

9 Alexandria Governorate

Taymour English School

Answer the following questions :

Question 1

A Write the scientific term :

1. They are safe areas established to protect the endangered species in their homeland.
2. It is a phenomenon that appears as brightly light curtains seen at both poles of the Earth.
3. Block of elements that arranged into two horizontal series at the lower part of the modern periodic table.
4. It is the arrangement of metals in a descending order according to the degree of their chemical activity.
5. Curved lines that join the points of equal pressure in the atmospheric pressure maps.
6. The rays that are trapped in the troposphere causing greenhouse effect.

B Give one example for :

1. An element that has zero electronegativity.
2. An endangered organism.
3. A pollutant that causes both ozone layer erosion and global warming.
4. A semi-metal element that is used in electronic devices.
5. An amphoteric oxide.

C Problem :

Calculate the temperature at a height 7252 meters above the sea level. (Knowing that the temperature at the sea level equals 22°C).

Question 2

A Give reasons for :

1. All bases are not considered alkalis.
2. Pilots prefer to fly their aeroplanes in the lower part of stratosphere layer.
3. Desert is considered as a simple ecosystem.
4. Bald eagle is called by this name.

B An element which is located in period (3) and group (5A). Find its atomic number and the name of its block in the modern periodic table.

C Correct the underlined words :

1. **Quagga** is a link between reptiles and birds.
2. **Covalent** bonds between water molecules is a **strong** bond.
3. Mesosphere is **the ozonic** layer as it contains a limited amounts of **ozone**.
4. **Mendeleev** discovered the positive protons.

Question 3

A Mention one use for :

1. Aneroid barometer. 2. Liquified Nitrogen. 3. Van-Allen belts.

B What is the effect of the following on health ?

1. Throwing human wastes in water.
2. Throwing mercury in water.
3. Filling plastic bottles with tap water.

C Show the effect of diluted hydrochloric acid on both magnesium and sulphur. (with the balanced chemical equation).

D Choose the correct answer :

1. The transition elements are found in ....
   a. s-block. b. d-block. c. f-block. d. p-block.
2. The correct order to arrange $_{5}B$, $_{20}Ca$, $_{12}Mg$ and $_{13}Al$, descendingly according to the atomic size is ....
   a. Ca > Al > B > Mg b. Ca > Al > Mg > B
   c. Ca > Mg > Al > B d. B > Al > Mg > Ca
3. The element that is found in group (1A) which and kept under paraffin oil and not kept under kerosene is ....
   a. sodium. b. cesium. c. lithium. d. bromine.
4. The temperature in troposphere reaches .... at its top.
   a. Zero°C b. - 90°C c. 1200°C d. - 60°C
5. The element which emits rays and can be used in preservation of food is ....
   a. Cobalt 60 which emits alpha rays. b. Cobalt 60 which emits gamma rays.
   c. Cobalt 50 which emits alpha rays. d. Cobalt 70 which emits gamma rays.
6. The strongest nonmetal in the modern periodic table, is ....
   a. sodium. b. cesium. c. fluorine. d. astatine.
7. The normal atmospheric pressure is .... at the sea level.
   a. 100 mbar b. 101325 mbar c. 1013.25 bar d. 1013.25 mbar

Question 4

A Complete the following sentences :

1. .... is a solidified resinous material which was secreted by pine trees in the old ages.
2. $Cl_2 + 2\ KBr \longrightarrow$ .... + ...
3. Hydrogen gas is collected above .... during water electrolysis.
4. Petrified woods considered as fossils in which the organic material of trees is replaced with ....
5. .... is an example of complete body fossil which were buried under ....
6. .... and foraminifera are microfossils, their presence indicates the formation of ....

B Write a property for :

1. Potassium.
2. Tropical forest.

C Answer the following questions :

1. Show by equations how ozone is formed.
2. Write an achievement for Bohr.
3. Mention one difference between helium and fluorine.

10 Alexandria Governorate — El-Agamy Directorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. All the following are greenhouse gases, except ....
   a. nitrous oxide. b. water vapour. c. carbon dioxide. d. methyl bromide.
2. The measuring unit of atomic radius is ....
   a. picometer. b. Dobson. c. gm. d. cm^3.
3. From the old extinct animals, ...
   a. panda bear. b. bald eagle. c. mammoth. d. quagga.
4. From the examples of amphoteric oxide ....
   a. CO_2 b. Al_2O_3 c. MgO d. N_2O

5. The inert gas that exists in period three has atomic number equals ....
   a. 3 b. 18 c. 10 d. 7
6. The scientist who was discovered the main energy levels, ...
   a. Bohr. b. Mosley. c. Mendeleev. d. Rutherford.

B Give reasons for :

1. Silicon slides are used in the manufacture of electronic devices.
2. El-Mokattam mountain was a sea floor since 35 million years.
3. The lower part of stratosphere is suitable for flying the aeroplane.
4. The water is polar compound.

Question 2

A Write the scientific term of the following :

1. Thinning or losing parts of the ozone layer at the south pole.
2. Dying out all members of one species of living organisms.
3. The ability of an atom in a covalent molecule to attract the electrons of bond toward itself.
4. Safe area that are established to protect endangered species in their homeland.
5. The arrangement of metals in descending order according to their chemical activity.
6. A water pollutant that causes the death of brain cells.

B Give one difference between the following :

1. Acidic oxides and basic oxides.
2. Thermosphere and mesosphere.
3. Simple ecosystems and complicated ecosystems.

C What's meant by ... ?

1. Metalloids.
2. Fossils.

Question 3

A Complete the following sentences :

1. The transition elements start to appear from period number ...., and consists of .... groups.
2. Ultraviolet radiations has .... effect, and inferared rays has .... effect.
3. Archaeopteryx fossil is a link between .... and ....
4. The new number of group (6A) is ...., and the new number of group zero is ....
5. Mesopause is the area between .... layer and .... layer.

B **Locate the following elements in the modern periodic table :**

1. $_{10}Ne$ 2. $_{6}C$ 3. $_{14}Si$ 4. $_{3}Li$ 5. $_{20}Ca$

C **Write the balanced chemical equations of the following :**

1. Burning a piece of coal.
2. Magnesium with diluted hydrochloric acid.
3. Sodium with water.
4. Chlorine with potassium bromide.

Question 4

A **Put (✓) or (✗) in front of the following statements, then correct the wrong ones :**

1. Yellowstone protectorate established to protect panda bear from extinction. ( )
2. Index fossils are used to determine the age of sedimentary rocks. ( )
3. Ionosphere layer lie at height 20 km from the sea level. ( )
4. The liquid halogen is chlorine. ( )
5. The atmospheric pressure decreases by increasing the altitude from the sea level. ( )
6. Traces indicate the activity of living organisms during their life. ( )

B **What happens when ... ?**

1. Solidification of resinous matter that secreted from pine tree in old geological age on an insect.
2. Van-Allen Belts scattering the harmful cosmic radiations.
3. Absence of one member species from a simple ecosystem.

C **Problem :**

If the temperature at the sea level 26 °C, find the temperature at the top of a mountain with a height equals 4000 m.

11 Alexandria Governorate

El-Montazah Directorate

Answer the following questions :

Question 1

A **Complete the following :**

1. From the basic oxides .... , while .... is an example of acidic oxide.
2. Most weather phenomena occur in the .... layer, while meteors are formed in .... layer.

3. Chlorine can replace .... and .... in a solution of their salts.
4. In group (1A) the lowest active metal is ...., while the most active element is ....

B Mention the following :

1. A solid halogen.
2. An endangered plant.
3. A kind of ultraviolet rays absorbed completely by the ozone layer.

C Problem :

If the temperature at the foot of a mountain equals 13°C. Find the temperature at its top if its height equals 2 km.

Question 2

A Choose the correct answer :

1. .... indicates the extinction.
   a. Fossils b. Protectorate c. Evolution d. Rocks
2. Increasing the ratio of .... element in drinking water causes blindness.
   a. lead b. mercury c. arsenic d. boron
3. The scientist .... discovered that the nucleus of an atom contains positive protons.
   a. Rutherford b. Moseley c. Mendeleev d. Bohr
4. All the following elements are located in the same group, except ....
   a. $_{19}K$ b. $_{11}Na$ c. $_{12}Mg$ d. $_{3}Li$
5. A halogen locates in the second period, so its atomic number equals ....
   a. 7 b. 9 c. 17 d. 19
6. All the following gases are greenhouse gases, except ....
   a. H_2O b. CO_2 c. N_2O d. SO_2

B Show by balanced chemical equation each of the following :

1. Reaction of bromine with potassium iodide.
2. Reaction between magnesium and dilute hydrochloric acid.

C Mention one importance of :

1. Liquefied nitrogen.
2. Methyl bromide gas.

Question 3

A Correct the underlined words :

1. Each period in the modern periodic table, ends with **a nonmetal**.
2. The commercial name of $C.F.C_s$ is **calcium fluoride**.
3. The complete body fossil of mammoth is preserved in **amber**.
4. The temperature decreases to **90°C** at the end of the troposphere layer.
5. The measuring unit of the atomic size is **cm**.
6. The transition elements start to appear at period number **3**.

B Locate the following elements in the modern periodic table :

1. $_{9}F$
2. $_{13}Al$

C Mention one difference between :

1. Simple ecosystem and complicated ecosystem.
2. Altimeter and aneroid.

Question 4

A Write the scientific term :

1. The ability of an atom of a covalent molecule to attract the electrons of the chemical bond toward itself.
2. The continuous decrease in the number of a certain species until they all die out.
3. The layer that contains charged ions, that is used in wireless communication.
4. They are bonds exist between water molecules.
5. The weight of air column of an atmospheric height on a unit area.

B Give reasons for :

1. Water have a high boiling point.
2. Piolets prefer to fly their planes at the lower part of the stratosphere layer.
3. Mendeleev considered that isotopes are different elements.

C Cross out odd word, then write the scientific term of the other :

1. Bald eagle / Rhinoceros / Ibis bird / Quagga.
2. $_{12}Mg$ / $_{13}Al$ / $_{11}Na$ / $_{3}Li$
3. Neon / Nitrogen / Helium / Argon.

12 Alexandria Governorate

East Alexandria Directorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. The number of elements in Mendeleev's periodic table is .... elements.
2. The scientist .... discovered the main energy levels of the atom.
3. Fossils are often found in .... rocks.
4. The normal atmospheric pressure equals .... mbar at the sea level.

B Write the scientific term of each of the following sentences :

1. The block that contains the groups from (3A) to (0).
2. The polar compound that consists of one oxygen atom and two hydrogen atoms.
3. The number of positive protons inside the nucleus of the atom of an element.
4. The halogen which exists in a liquid state.

C From the opposite figure :

1. What is the name of this group ?
2. What is the valency of its elements ?

X
$_{11}Y$
Z
L
M

Question 2

A Choose the correct answer :

1. Complete body fossils of insects are found preserved in ....
   a. ammonites. b. amber. c. igneous rooks. d. air.
2. All of the following gases are greenhouse gases, except ....
   a. O_2 b. CO_2 c. N_2O d. CH_4
3. There are .... bonds among water molecules.
   a. hydrogen b. covalent c. ionic d. metallic
4. .... is not considers from halogens.
   a. Sodium b. Chlorine c. Florine d. Iodine

B Put (✓) or (✗) in front of the following statements :

1. Papyrus is considered as an extinct plant. ( )
2. Cobalt 60 emits gama rays. ( )
3. The complete body fossil of mammoth found preserved in snow. ( )
4. Both oil and sugar are covalent compounds. ( )

C Compare between :

Mesosphere and thermosphere "concerning : importance – temperature at its top".

Question 3

A Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Sodium	a. is used in extinguishing fires.
2. Carbon	b. is a metal.
3. Halon	c. is used in making foam backing.
4. Freon	d. is a nonmetal.

1. .... 2. .... 3. .... 4. ....

B Correct the underlined words :

1. The thickness of ozone layer in the stratosphere layer is (60) km.
2. The element which is located in period (3) and group (3A) is $_5B$.
3. Mesopause is located between stratosphere and mesosphere layers.
4. Tap water doesn't affect litmus paper.

C Give a reason for the following :

Liquefied nitrogen is used in the preservation of cornea of the eye.

Question 4

A Cross out the odd word :

1. Dinosaur / Panda bear / Dodo Bird / Quagga.
2. Mosses / Reptiles / Invertebrates / Fish.
3. Helium / Neon / Hydrogen / Argon.
4. Silicon / Bromine / Boron / Arsenic.

B Give an example for each of the following :

1. Traces of an old living organism.
2. Negative effects of global warming phenomenon.
3. One of the natural water pollutants.
4. A basic oxide.

C Express with a balanced chemical equation :

The reaction between magnesium and diluted hydrochloric acid.

13 Qalyoubia Governorate

Science Inspectorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. In the modern periodic table, elements which are similar in their chemical properties are located in the same ....
2. In the modern periodic table, d-block contains .... elements.
3. An example of polar compounds is .... , that has a neutral effect on litmus solution.
4. The strongest nonmetal element locates in group .... in the modern periodic table.

B Give an example for each of the following :

1. An endangered plant.
2. A pollutant of ozone layer.
3. An extinct non-flying bird.
4. An element that doesn't react with water.

C Locate the following elements in the modern periodic table :

1. $_{11}Na$
2. $_{20}Ca$

Question 2

A Write the scientific term for each of the following :

1. They are safe areas established to protect endangered species in their homeland.
2. The descending arrangement of metals according to their chemical activity.
3. The region between troposhere and stratosphere.
4. The block that contains the series of lanthanides and actinides.

B Mention the measuring unit for each of the following :

1. The atomic size of the element.
2. The degree of ozone.
3. The atmospheric pressure.

C Problem :

If the temperature at the sea level is 30°C. Find the temperature at a height of 6 km.

Question 3

A Choose the correct answer :

1. All of the following are greenhouse gases, except ....
   a. CO_2 b. O_2 c. N_2O d. CH_4
2. P-block contains .... groups.
   a. 10 b. 2 c. 6 d. 8
3. The .... replaces the wood material, part by part of an old tree.
   a. copper b. iron c. sodium d. minerals
4. During electrolysis of water the volume of evolved oxygen gas is .... the volume of evolved hydrogen gas.
   a. equal to b. half c. twice d. quarter

B Complete the following equations :

1. $Cl_2 + 2KBr \longrightarrow$ .... + ...
2. $MgO + H_2O \longrightarrow$ ....
3. $CO_2 +$ .... $\longrightarrow H_2CO_3$

C Mention one difference between :

Simple ecosystem and complicated ecosystem.

Question 4

A Correct the underlined words :

1. When water freezes, its density **increases.**
2. The modern periodic table contains **100** elements.
3. **Methyl bromide gas** used in extinguishing fires.
4. The complete body fossil of **mammoth** is found preserved in amber.

B Put (✓) or (✗) in front of the following statements, then correct the wrong ones :

1. Infrared radiation has a chemical effect. ( )
2. Altimeter is used for determining the possible day weather. ( )
3. Foraminifera are from microfossils. ( )
4. Meteors are formed in stratosphere layer. ( )

C Give a reason for each of the following :

1. Pilots prefer to fly their planes in the lower part of stratosphere.
2. Mendeleev left gaps in his periodic table.

14 Menofia Governorate — Shabien El-Koum Directorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. Sodium is kept under the surface of .... to prevent its reaction with ......
2. Mesosphere layer is highly rarefied, because it contains a limited quantities of .... and .... gases only.
3. .... + ... $\longrightarrow$ H_2CO_3
4. Fossils are used in .... exploration and determining the age of ....

B Study the opposite figure which represents a part of the modern periodic table, then answer the following questions by using it :

$_1H$					
$_3Li$	$_4Be$	$_5B$	$_6C$	$_7N$	$_8O$
$_{11}Na$					
$_{19}K$					

1. The element that has the highest electronegativity is ....
2. The element that has the greatest atomic size is ....
3. This part represents the group number .... and the period number ....
4. The element which has the lowest metallic property in this group is ....

C Write the balanced chemical equation, that illustrate the reaction between chlorine and potassium bromide.

Question 2

A Choose the correct answer :

1. The average age of the lower layers of sedimentary rocks is .... that of its upper layers.
   a. more than b. less than c. equal
2. .... contains charged particles and it has an importance in wireless communications.
   a. Mesosphere b. Stratosphere c. Ionosphere
3. The kind of rays which are emitted from cobalt 60 is ....
   a. ultraviolet rays. b. infrared radiation. c. gamma rays.
4. (X) is an alkali metal that reacts with oxygen to form a chemical compound known as ....
   a. X_2O_2 b. X_2O c. XO_2

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B **Cross out the odd word or symbol:**

1. Al^{+3} / Na^{+1} / Mg^{+2} / O^{-2}
2. Dodo bird / Panda bear / Bald eagle / Papyrus plant.
3. Oxygen gas / Organic fertilizers / Animals wastes / Mercury.
4. Saint cathrine / Ras mohamed / Wadi El-Hetan / Petrified forest.

C **Problem :**

Calculate the height of a mountain if temperature at its foot is 30°C and at its top is – 9°C.

Question 3

A **Write the scientific term for each of the following :**

1. It is the weight of air column of atmospheric height on a unit area ($1m^2$).
2. Replacing part by part of the wood material of an old tree by minerals to form petrified wood.
3. Elements which have the properties of both metals and nonmetals.
4. A water pollutant, which causes the death of brain cells.

B **Choose the correct word from inbetween brackets :**

(bromine – lose electron(s) – increases – HCl – decreases – iodine – gain electron(s) – CO_2)

1. The halogen which exists in a solid state is ....
2. The density of air .... as we go up.
3. During a chemical reaction, a metal atom tend to ....
4. The most important greenhouse gas is ....

C **What is the difference between ... ?**

Simple ecosystems and complicated ecosystems.

Question 4

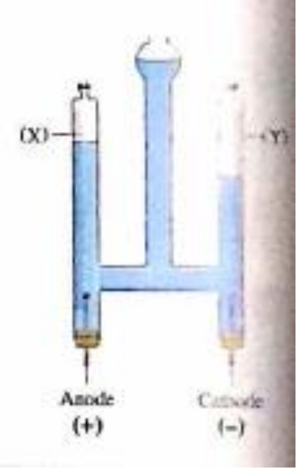
A **Correct the underlined words :**

1. Some **salts** dissolve in water forming alkalis.
2. **Halons** are produced among the burning of fuel of supersonic aeroplanes.
3. Amber protects the **mammoth** inside it from decomposition.
4. The cast is a replica of the **interior** details of an ancient living creature.

B **Give reasons for :**

1. Sugar is dissovling in water although it is a covalent compound.
2. Occurrence of aurora phenomenon.
3. The global warming phenomenon has negative effects on the Earth.
4. El-mokattam's mountain was a sea floor more than 35 million years ago.

C When the electrolysis of acidified water done by using Hofmann's voltammeter (as shown in opposite fig.)
If the sum of the two evolved gases (x) and (y) is 24 cm^3 calculate the volume of each one of the two evolved gases.



END